

SECTION 4.0 AFFECTED ENVIRONMENT

4.1 Introduction

This section provides a description of the existing built and natural environment at the Airport and the immediate surroundings.

4.2 Airport Facilities

The Airport is located in Provincetown, Massachusetts on the northern tip of Cape Cod (Figure 1.2). The Airport is within the Cape Cod National Seashore (CCNS), sited on approximately 322 acres of federally owned land administered by the NPS.

The Airport is a Non-hub Primary Service airport as defined by the FAA National Plan of Integrated Airport Systems. It is a public use, commercial service airport with scheduled Cape Air airline passenger service to and from Logan International, enplaning 10,000 or more passengers annually. JetBlue Airways and Cape Air have formed a marketing partnership. JetBlue has placed its code on flights operated by Cape Air, making it possible for customers to book travel on a single itinerary between Provincetown and other cities that connect through JetBlue at Logan.

The Airport is one of eleven airports in Massachusetts that have a runway with full Instrument Landing System (ILS) approach capabilities. Throughout this document the Airport is referenced using either its 3-letter FAA airport identification code, PVC, or as the Airport. This and other terms are defined in the document and the Glossary provided in Appendix 8.

The Airport consists of developed airside and landside areas maintained for airport facilities and operations, as well as undeveloped areas that consist of grasslands, coastal dunes, and wetlands. The existing environmental resources in the undeveloped areas of the Airport are discussed later in this Section.

Airside Facilities

Airside facilities include a single runway (Runway 7-25), a taxiway system, aircraft parking aprons (ramps), an approach lighting system (MALSF), navigational aids, and weather instrumentation (AWOS). See Figure 4.1, Airside Facilities, for the locations of these facilities.

Runway 7-25 is 3,500 feet long and 100 feet wide. The runway was first paved in 1948. The most recent reconstruction of the runway was completed in 2003 and also included construction of runway safety areas (RSA). The RSAs are now in full compliance with FAA design standards.

The taxiway system provides aircraft with direct routes between the terminal area and the runway. The taxiways at the Airport include a parallel taxiway and three entrance taxiways. The West End and Mid Connector taxiways are jug-handle shaped because at the time they were built, the large tail dragger DC-3 aircraft (no longer in use) was the largest aircraft using the runway. The jug handle shapes allowed the larger DC-3s landing on Runway 25 to exit the runway with a more gradual turn, and the smaller airplanes at somewhat higher speeds. The East End taxiway was reconstructed, but not relocated, as part of the

reconstruction of the runway in 2003. The East End taxiway requires a 200-foot back-taxi to depart from Runway 25.

The aircraft parking aprons at the Airport include both paved and turf aprons. There are two paved parking aprons. One is adjacent to the terminal area (Terminal Apron) and is used to support commercial service at the Airport. The other paved apron (GA Apron), used by general aviation aircraft, is located southwest of the sightseeing shack (discussed later in this section). The two turf aprons are located west of the paved General Aviation apron along the parallel taxiway.

The ILS system consists of a glide slope antenna, the glide slope critical area (a flat area maintained to bounce radio signals), a localizer antenna and its critical area, and an approach lighting system and its critical area. The ILS allows aircraft to land at the Airport when visibility is reduced below three statute miles and ceilings are below one thousand feet. The Airport also has an on-field Automated Weather Observation Station (AWOS).

Landside Facilities

Landside facilities include a terminal building, aircraft hangar, an aircraft rescue and firefighting/snow removal equipment garage (ARFF/SRE), ground support facilities, the former administration building referred to as the Sightseeing Shack, and an auto parking area. See Figure 4.2, Landside Facilities, for the location of these facilities.

The terminal building, reconstructed in 1998, is an approximately 4,800 square foot single story wooden structure with post and beam construction. The terminal provides passenger facilities, Transportation Security Administration (TSA) screening areas, and a conference room. Passenger facilities include vending machines, bathrooms, ticketing counters, passenger queuing space, and passenger circulation and waiting areas. The interior of the terminal is shown in the following photo. Figure 4.3 shows the exterior of the building and the interior floor plan.



Photo 4-1 Interior of Terminal TSA area to right.

The single hangar at the Airport is owned by the Town of Provincetown and operated by Cape Air. Since 1989, Cape Air has been the Airport's Fixed Base Operator (FBO), as well as the commercial service operator for the Airport. The hangar, shown in the following photo, is a 6,000 square foot steel-framed structure that houses a large central bay for aircraft storage. No scheduled maintenance operations are conducted in the hangar. The hangar is attached to the passenger terminal building.



Photo 4-2 The Hangar. Several aircraft can be stored.

The fuel farm, shown in the following photo, is owned by the Town of Provincetown and leased by Cape Air. It is located west of the terminal building and northeast of the sightseeing shack. There is one 10,000-gallon below ground tank. The fuel tank is a double steel walled underground tank with a leak detection monitoring system.



Photo 4-3 The Secure Fuel Pump Station Earth covered fuel tank is in background.

The ARFF/SRE garage, owned by the Town of Provincetown, is located on the east end of the terminal ramp, next to the employee parking lot. The garage is approximately 40 feet wide by 80 feet long, as shown in the following photo. The garage houses the ARFF vehicle and some SRE equipment. Maintenance of these vehicles is conducted by the Town or private contractors, off-airport.



Photo 4-4 ARFF/SRE Storage Garage.

The Sightseeing Shack, owned by the Town of Provincetown, is thought to be the original administration building which was built around 1948. Passengers for the summer sightseeing flights used to wait on the porch but TSA restrictions now require passengers to wait in front of the Terminal until they are escorted to the planes. It includes a small bathroom (now out of service), airfield navigational aid electrical equipment, a Remote Communications Outlet (RCO) for radio signal repeater equipment, and the airfield electric lighting vault. There is a small front porch where GA pilots are requested to register as they arrive, as shown in the following photo.



Photo 4-5 Sightseeing Shack. Photo taken prior to TSA restrictions that now prohibit unescorted access to the building. FAA Communications is in background.

The Airport has free parking for passengers and visitors and an employee parking area. There are 62 automobile parking spaces located in front of the terminal building, on the north side as shown in the following photo. Five of these spaces are allocated for automobile rentals, four are allocated for taxi stands, and three are allocated for handicapped plate (HP) vehicles, with the remaining 50 spaces allocated for passengers and visitors. The central access aisles are paved with bituminous concrete, and the spaces consist of crushed gravel with a cement capstone to indicate individual parking spaces.

There is also a 20-space employee gravel parking area located east of the terminal area that can be seen in Photo 1-7. This parking area has no direct access to the terminal side of the Airport. There is a secure pedestrian gate for authorized employees, which allows access to the secure side of the terminal area. The employee lot consists of crushed gravel with no space boundary markings. There is a bituminous entrance road from Race Point Road leading across the NPS bicycle path into the employee parking area.



Photo 4-6 Entrance to Airport Parking Lot.

The Airport's existing security fencing is located at the east end of Runway 7-25, around the terminal apron and around the fueling station as shown in the following photo.



Photo 4-7 Existing Airport Security Fencing. Locations are indicated in yellow. Employee parking lot is in upper center of photo.

4.3 Transportation (Auto Parking/Aviation Operations/ Transportation Demand Management (TDM) / Pedestrian/Bicycle)

Auto Parking

The Airport parking lot has 62 spaces, including 3 spaces allocated for handicapped plate vehicles and 5 for the rental car company. Employees are required to park their vehicles in a separate, designated area.

Aviation Operations

An Aviation Operation refers to an aircraft arriving or departing the Airport. One aircraft arrival and departure is equal to two operations. In addition to an aircraft taking off or landing, an operation also includes aircraft flying approaches to the instrumentation located at the Airport (touch and go).

The Airport is serviced by Cape Air which is the commercial airline traveling between Boston International and Provincetown Airport. The number of commercial operations varies from four daily flights (eight operations) during the off-season to eight daily flights during the peak season. Previous peak seasons have indicated that up to eight sections (term used for additional planes) could be added to each flight time. This means that there are eight aircraft during one flight schedule period. Sections are added to flights in an on-demand passenger basis to support the number of passengers needing to fly to and from Boston.

The GA operations also vary during peak seasons. The summer months historically account for 75% of annual aircraft activity. There is also a corresponding change in the aircraft type using the airport. During off-season months, the typical aircraft are single engine piston and the twin engine Cessna 402. Summertime aircraft use includes a variety of larger turbine aircraft and helicopters.

The FAA maintains the navigational equipment at the Airport. There is a high demand and use of this equipment during the summer period. The FAA shuts down the runway when working on the majority of airfield navigational equipment during both routine maintenance and during periods that the navigational aids need adjusting. The AWOS navigational facility can be serviced during runway operations if the FAA can locate the service vehicle outside any object free area and away from a navigational critical area.

Transportation Demand Management (TDM) Measures

Currently, there are three measures in place that can be referred to as Transportation Demand Management (TDM) measures. These are rental car availability, taxi cabs, and a shuttle bus service to Provincetown managed by the Cape Cod Regional Transit Authority (CCRTA). A rental car company currently operates out of the Airport and 5 spaces in the parking lot are allocated for rental cars.

The primary taxi cab companies in Provincetown typically have one taxi coordinated with the arrival of the scheduled Cape Air commercial service. The cab companies encourage ride sharing during peak periods with a standard six dollars per person rate to downtown from the Airport.

The Breeze shuttle bus route has included a stop at the Airport during past summers. The shuttle bus schedule was not synchronized with Cape Air commercial flights. Due to funding issues, the shuttle service has been changed from a scheduled service to an “on-call” service.

Currently there is no fee to park at the Airport. Although summer beach visitors occasionally use the Airport parking lot instead of the beach lot to avoid a fee, it is unlikely that the parking capacity for Airport users is affected. At this time there is no plan to implement a parking fee because it would require additional staffing at the Airport.

Bicycles/Pedestrians

Bicycles are typically not a mode of transportation used to go to the Airport. However the Provincetown Airport is immediately adjacent to the Province Lands Bicycle Path, a dedicated off-road paved path that leads most of the way to Provincetown center.

Race Point Road does not have any sidewalks throughout its entire length and pedestrians are allowed to use the bicycle path as a walkway.

4.4 Wetlands and Wetland Buffer Zones

Wetlands

The Cape Cod National Seashore supports a wide variety of marine and freshwater resources formed by the geological events that created Cape Cod, many of which are found within the Provincetown Municipal Airport lands. The geologic characteristics combined with a fluctuating, seasonally-high groundwater table results in seasonal saturation of the upper portion of the soil profile for significantly long periods of time during early portions of the growing season. Inundated and/or saturated soil conditions favor the establishment of hydrophyte-dominant plant communities and the deposition of organic material, which are typical of wetland habitats. Rainfall received during storm events also contributes to saturated soil and inundated land conditions.

Wetland habitats at the Airport include isolated freshwater wetlands dominated by grass and herbaceous species (Palustrine Emergent Wetlands or PEM), shrub-dominated isolated wetlands (Palustrine Scrub-Shrub Wetland or PSS); and isolated freshwater forested wetlands (Palustrine Forested Wetland or PFO) dominated by pitch pine (*Pinus rigida*). These isolated wetlands, ranging in size from a few hundred square feet to several acres in size, are associated with coastal interdunal swales and are often separated from each other by low to moderate dune ridges closer to the airfield and extensive higher dune ridges, oriented approximately parallel to the Airport runway further out from the airfield. Isolated PSS wetlands also occur within the existing airfield, located between the existing taxiways and the runway, and separated from paved surfaces by managed grassland communities of varying width.

The shrub-dominant interdunal wetlands (PSS), which are the predominant type of wetland habitat at the Airport, have a non-tidal, seasonally or temporarily flooded water regime. The relatively dense shrub communities include plant species such as winterberry (*Ilex verticillata*), red maple (*Acer rubrum*), meadowsweet (*Spiraea latifolia*), highbush blueberry (*Vaccinium corymbosum*), northern bayberry (*Myrica pensylvanica*), red chokeberry (*Aronia* spp.), and American cranberry (*Vaccinium macrocarpon*), which often occurs in dense mats. Herbaceous plants observed frequently among the Airport wetlands include sphagnum moss (*Sphagnum* spp.), various sedges (*Carex* spp.), rushes (*Juncus* spp.), cinnamon fern (*Osmunda*

cinnamomea), royal fern (*O. regalis*), and sensitive fern (*Onoclea sensibilis*), common reed (*Phragmites australis*), wide-leaf cattail (*Typha latifolia*), woolgrass (*Scirpus cyperinus*), and various goldenrods (*Solidago* spp.).

Within the pitch pine-forested area between the runway and the steep coastal dune habitat to the southeast of the Airport managed areas, there is an extensive mosaic of additional interdunal forested wetland swales. Within these freshwater wetlands, pitch pine has adapted to the seasonally saturated conditions and is considered a local wetland indicator species.

In the far western reaches of the Airport, there is a larger wetland system (Wetland C/J/FK) that transitions along a salinity gradient from a freshwater system (PEM-PSS-PFO) to a brackish system (primarily PEM, trending toward Estuarine Emergent Marsh or EEM) as groundwater seeps are met with the tidal influence of the Hatches Harbor estuarine system. Brackish portions of this wetland system are dominated by a non-native invasive species, common reed (*Phragmites australis*). Efforts to control and manage this invasive plant community were implemented in the early 2000s through the Hatches Harbor Restoration Project, and areas of *Phragmites* die-back with an emerging salt marsh community can be observed along the landward-reaches of the restored salt water regime influence. One small area of this emerging salt marsh plant community was identified and delineated in the field (“SM”). Wetland areas in the vicinity of the proposed project footprints for each project element, including potential alternative locations, were delineated in the field and are depicted on Figures 4.4 and 4.5 found at the end of this section. Wetland areas are also identified on figures in Sections 3 and 6.

It should be noted that the wetland areas at the airport are protected and regulated under several different wetlands laws, including the Federal Clean Water Act (33 U.S.C. 1251, et seq.), the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131 § 40), the Town of Provincetown Wetlands Protection Bylaw (Chapter 12 of the Provincetown General Bylaws), and the Cape Cod Commission Act (Chapter 716 of the Acts of 1989). During the earlier planning stages of the Airport CIP projects, the Airport delineated only those wetland areas in close proximity to the proposed project elements and/or their alternative locations within the 322-acre Airport site. Each wetland area was assigned a unique alphabetical designation.

The wetland areas have been reviewed and approved by the local Provincetown Conservation Commission under state and local wetlands laws, specifically through an Abbreviated Notice of Resource Area Delineation (ANRAD). The Order of Resource Area Delineation (ORAD) was issued on January 25, 2007, and was recently renewed until January 2013. The U.S. Army Corps of Engineers has also issued a Preliminary Jurisdictional Determination (JD) under the Federal Clean Water Act, acknowledging the presence of “waters of the United States” at this site. A complete description of all delineated wetland areas and copies of the state and local wetlands approvals and the Preliminary JD are provided within Appendix 2. A brief description of the affected wetlands is provided below.

The West End TW is situated adjacent to Wetland C/J/FK (a transitional PSS-PEM in this location) and Wetland I (a scrub-shrub community), and is separated from these wetlands by managed grasslands. Vegetation within each of these wetland areas is maintained for Airport safety. As noted above, seaward portions of Wetland C/J/FK are tidally-influenced and evidence of dieback due to an increase in salinity near this TW End has been observed. Wetland I is non-tidal and has a seasonally or temporarily flooded water regime. Vegetation within Wetland C/J/FK in this location includes winterberry, arrowwood (*Viburnum*

dentatum), meadowsweet, blue-joint (*Calamagrostis canadensis*), American cranberry, and rose (*Rosa* sp.). Lesser amounts of purple loosestrife (*Lythrum salicaria*), wide-leaf cattail (*Typha latifolia*), and woolgrass are also present, along with significantly large communities of common reed. Vegetation within Wetland I includes red chokeberry, winterberry, meadowsweet, steplebush (*Spiraea tomentosa*), highbush blueberry, American cranberry, bayberry, and poison ivy (*Toxicodendron radicans*). Relocation of the West End TW will occur within a portion of Wetland I, while portion of the safety/security fence and the improvements to the access road for the MALSF approach lights will occur within freshwater portions of Wetland C/J/FK.



Photo 4-8 Coastal Intertidal Marsh Community.

The view is south of runway with pitch pine dune habitat to the right.

The East End TW is adjacent to Wetland B. As with Wetland I, this isolated wetland is separated from impervious surfaces to its north, west, and south, by managed grasslands, and is bounded by low dune habitat to its southeast, east, and northeast. Plant species observed within Wetland B included American cranberry, highbush blueberry, dangleberry (*Gaylussacia frondosa*), meadowsweet, winterberry, pitch pine, willow (*Salix* spp.), various sedges and rushes, and small patches of common reed. Relocation of the East End TW and a portion of the security/safety fence will occur within portions of Wetland B.

Wetland C, which is one of the larger isolated wetlands at the Airport, is located immediately north of the existing partial parallel taxiway. This wetland is non-tidal and seasonally or temporarily flooded. This wetland is largely a scrub-shrub community, interspersed with emergent marsh habitat within its interior. Portions of Wetland C are managed to maintain Airport safety areas. Commonly observed plant species within this wetland included winterberry, arrowwood, meadowsweet, blue-joint, American cranberry, and rose. The easternmost corner of Wetland C, nearest the Airport terminal building and parking lot, is a forested palustrine habitat (PFO) supporting a mature community of willow trees. A portion of the security/safety fence will occur within a portion of Wetland C.

Wetlands L and K, located south of the Airport runway and adjacent managed grasslands, comprise a large isolated forested freshwater wetland (PFO) that gradually transitions to a scrub-shrub community in the southern and eastern portions of these wetlands. This wetland system is separated from surrounding isolated wetlands by low dune ridges and pockets of dune communities are found within its interior. Forested areas are dominated by pitch pine with a sparse shrub community and a groundcover dominated by cranberry. The northernmost portions of Wetland L are subject to vegetation management practices to maintain Airport safety zones, and woody vegetation is periodically cut once it reaches above a certain height. In these areas, the habitat is maintained as a PSS-PEM wetland community. Wetland K is largely open within its interior, supporting an emergent marsh community dominated by cranberry and various sedges and a small amount of common reed. Wetland K has been observed to support standing water throughout the year. A portion of the security/safety fence will occur within portions of Wetlands L and K, although not within the portion of Wetland K that supports year-round standing water.



Photo 4-9 Cranberry-Pine Swales. This is considered a local wetland habitat type.

A series of smaller isolated wetlands interspersed with low rising dune ridges occupies the southeastern corner of the Airport. Smaller wetlands are occupied primarily by a few pitch pines with cranberries and occasional sedges, while moderate-sized wetlands are often forested along the perimeter with open cranberry swales intermingled with dense areas of shrubs toward the interior. Each of these wetlands is supported by a non-tidal, seasonally wet hydrologic regime. A portion of the security/safety fence will occur within portions of this series of freshwater wetlands, specifically within Wetland DB/FG, Wetland E/DD, and Wetland BC/F.

Wetland Buffers

Buffer zones, the upland (non-wetland) areas surrounding a wetland that often separate the wetlands from developed areas, also occur at the Airport. In accordance with certain state, regional, and local wetlands protection bylaws and regulations, most, if not all of the wetland areas found at the Airport are afforded a 100-foot jurisdictional buffer zone. The Corps, while not asserting jurisdiction over wetland buffers, recognizes the importance of maintaining undisturbed buffers around wetlands to further their protection.

In general, the jurisdictional 100-foot buffer zone to the wetland areas at the Airport consists of one or more of the following elements: undisturbed, naturally-vegetated coastal dunes, managed grasslands, impervious surfaces (buildings, pavement), or in some cases, where wetland areas are in close proximity to each other, the 100-foot jurisdictional buffer zone to one wetland may encompass one or more of the adjacent wetland areas. The collective 100-foot jurisdictional buffer zone to the wetland areas is depicted on Figure 4.5 at the end of Section 4.0. Areas of affected buffer zone are also identified in this figure.

4.5 Floodplain

In 1930, a dike was constructed across the Hatches Harbor salt marsh to restrict tidal flow to approximately 200 acres of salt marsh in an attempt to control salt marsh mosquitoes. In the 1940s the Airport was constructed on land that was filled in behind the dike. The Airport is within the 100-year floodplain as designated on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map dated 1985.

The Hatches Harbor Restoration Project was begun in the 1990s by the NPS in partnership with the Town of Provincetown to restore up to 90 acres of salt marsh behind the dike. Several local, state, and federal agencies approved the salt marsh restoration plan. During the winter of 1998-99, new culverts with adjustable tide gates were installed in the dike to gradually allow tidal flow into the marsh.

The isolated freshwater wetlands on the site are presumed to be Isolated Land Subject to Flooding (ILSF).

4.6 Coastal Dunes

Coastal dune habitats at the Airport can be classified as Maritime Dune, Maritime Shrubland, or Maritime Pitch Pine on dunes, as described in the Classification of the Natural Communities of Massachusetts published by the Massachusetts Natural Heritage & Endangered Species Program (NHESP). Dunes are hills of sand generally parallel to the coastline, which form a natural barrier between the sea and the mainland. The composition and structure of the vegetation depend on the dune stability. The dune closest to the beach is called the primary dune. Secondary dunes are landward of the primary dune.

The coastal dune habitats located along the lease line to the northwest of the airfield are mapped within the boundaries of the Race Point barrier beach system. Although the barrier beach system includes both primary and secondary dune habitats, there are no primary dunes located within the Airport lease area. Dunes north of the Airport are generally vegetated with American beachgrass and common hairgrass in open exposed areas. Occasionally, seaward-facing slopes (both primary and secondary dunes) are completely devoid of vegetation. Topography among these dunes varies widely from nearly flat to steeply sloping.



Hensley Willett Group

Photo 4-10 Open Coastal Dune Habitat The dunes along the northern lease line range from steeply sloping (on the left) to nearly flat (foreground).

The coastal dune habitats located to the southeast of the airfield are secondary coastal dune habitats that are not within the barrier beach system. While the topography among these secondary dunes is equally varied, the more stable substrate of these areas supports a greater diversity of vegetative species, including trees and shrubs. It is in these areas that communities of Maritime Pitch Pine on Dunes and Maritime Shrubland occur to varying degrees. Coastal dune areas are indicated on Figure 4.4.



Photo 4-11 Pitch Pine on Coastal Dune habitats located to the southeast of the Airfield include a mosaic of pitch pine and open areas.

4.7 Cultural Grasslands

Cultural Grassland habitat, shown on Figure 4.4, at the Airport includes primarily Cultural Grassland with incipient (or developing) Sandplain Grassland and/or Sandplain Heathland. Cultural Grasslands result from the Airport's active mowing of the airfield's operational safety areas, in compliance with FAA regulations, and

occur adjacent to the taxiway and runway. These areas are mowed frequently to maintain runway and taxiway safety areas as well as the clear surfaces for navigational instrumentation. Sandplain Grasslands are open communities with grasses and occasional small shrubs, which are maintained naturally by fire and salt spray, and less frequently by vegetation pruning. Sandplain Heathland is open with shrubs and low-growing trees such as scrub oak. Additional information on the grassland habitats at the Airport is provided in the wildlife habitat report in Appendix 2.



Photo 4-12 Cultural
Grassland.

These areas adjacent to the parallel taxiway are maintained for safety.

4.8 Rare Species Habitat

There are no federally listed or proposed endangered or threatened species that have been identified at the Airport. The beaches north and west of the Airport are known to support federally-threatened piping plovers. Piping plovers are closely monitored by the NPS. They nest and forage primarily along the shoreline and, at lower densities, within the dunes and cobble fields south of the shoreline and adjacent to the Pole Line Route sand road. Plovers in these more interior areas frequently forage in the Hatches Harbor system. However, plovers have not been known to nest or forage in or adjacent to the Airport. The NPS has indicated that they treat all State-listed species (as listed by NHESP) the same as any Federally-Threatened or Endangered species, and, in addition to minimizing impacts, will seek to further their protection along with promoting their recovery and security on a Federal level.

The Massachusetts Natural Heritage Atlas (October 2008) maps the entire Airport lease area within both Priority Habitat of Rare Species and Estimated Habitat of Rare Wildlife and Certified Vernal Pools. These designations are made by the Massachusetts Division of Fisheries and Wildlife, NHESP. Based on observations made by NPS biologists and submitted to NHESP, the Airport is mapped for four State-listed rare species: Eastern Box Turtle, Eastern Spadefoot Toad, Vesper Sparrow, and Broom Crowberry. To support the preparation of the EIR/EA and permit applications, species-specific surveys were performed by the Horsley Witten Group (HW) between 2004 and 2005, and again in 2008. General wildlife habitat assessments were

performed by HW staff between 2004 and 2006, with additional data gathered in 2007 and 2008. All habitats encountered were evaluated for their ability to provide suitable habitat for rare species. Of these four species, HW staff recorded a population of Broom Crowberry within the managed Cultural Grasslands near the glide slope antenna, and a single female Eastern Box Turtle was observed in June 2007. The presence of the other two species at the Airport, however, is confirmed in records of the NPS.

Habitat requirements for each of the four species and the location of potential habitat for rare species are discussed below. Figure 4.6, taken from the Natural Resources Inventory and Rare Species Habitat Assessment Report, provided in Appendix 2, depicts the approximate areas of potential habitat within the Airport lease area for each of the four species based upon field observations and supplemented with available source data from MassGIS for areas not assessed in the field. Since the filing of the DEIR, additional habitat assessments were conducted for the Eastern Spadefoot Toad to further refine potential habitat areas. The updated habitat information is reflected in this document.

Broom Crowberry

Broom Crowberry is a Massachusetts Species of Special Concern. It is a low-growing, densely branching evergreen shrub that inhabits open areas (low shrub communities or sandy flats, as well as dry pitch pine/scrub oak barrens and relic sand dunes). The NHESP-described natural communities with which this species is associated include Sandplain Heathland and Pitch Pine – Scrub Oak Communities. Broom Crowberry was previously reported at the Airport in the managed Cultural Grassland habitat. The presence of a small population of Broom Crowberry was confirmed within the Cultural Grassland area that is maintained for the glide slope critical area. Potential habitat for this species is located throughout the Airport lease area (outside of the wetland areas), although no additional individuals or populations of Broom Crowberry have been encountered.

Eastern Box Turtle

The Eastern Box Turtle is a Massachusetts Species of Special Concern. This small terrestrial turtle uses a relatively wide range of habitats, including woodlands, field edges, thickets, and wetlands. Optimal habitats on Cape Cod include pine barrens and oak thickets, where box turtles are associated with cranberry-dominated swales. This species would be considered a generalist in the context of habitat preference, and potential habitat for this species is found throughout the Airport lease area.

As noted above, a single individual Eastern Box Turtle was observed during an on-site meeting in June 2007. Suitable habitat for this species is present, particularly in areas within the southern portions of the Airport, which are classified as Maritime Dune and Coastal Interdunal Marsh/Swale communities. Here, foraging habitat and abundant food sources are found within close proximity to open areas of sand suitable for nesting habitat. All pitch-pine dominated habitats, including the cranberry-pine swales, as well as the lower slopes of the pitch pine and oak-dominant dune habitats provide potential habitat for Eastern Box Turtles.

Eastern Spadefoot Toad

The Eastern Spadefoot Toad is a Massachusetts Threatened Species. Reported habitat for this medium-sized toad species includes dry sandy or loose soils in areas of sparse shrub growth of open forest areas with adjacent shallow, temporary pools that provide breeding habitat. Portions of the Airport provide suitable habitat features

for this species, particularly south and southeast of the Airport runway and, as noted above, presence of this species has been observed at the Airport by NPS biologists. A detailed habitat suitability study was conducted by HW field biologists in the spring of 2008 to identify prime and potential breeding habitat for this species at the Airport. HW worked in conjunction with Brad Timm, Ph.D. candidate and Eastern Spadefoot Toad specialist, to complete the field surveys of Eastern Spadefoot Toad habitat and to update the habitat maps included within this document (see Figure 4.7, and Appendix 2).

Vesper Sparrow

The Vesper Sparrow is designated as a Threatened Species in Massachusetts. This small sparrow is reported to inhabit open areas (cultivated fields, grasslands, fallow fields, and pastures), as well as Sandplain Heath lands. This species was not observed during the 2004-2006 habitat surveys, but has been recorded during prior surveys. Potential habitat for the Vesper Sparrow occurs within the managed Cultural Grasslands adjacent to the Airport runway, taxiway, and runway approach areas and the immediately adjacent maintained shrub thickets, as well as throughout the open grassy dune habitats to the north and west of the Airport. Regular mowing of the Cultural Grasslands as part of routine Airport maintenance, in part, provides suitable habitat for this species.

4.9 Drainage/Stormwater Management

Approximately six percent of the 322-acre airport site is paved. All stormwater runoff from the facility is discharged on site, through runoff infiltration. The Airport is located within the CCNS, and as such all waters (and wetlands) in and adjacent to the CCNS are designated Outstanding Resource Waters (ORW) pursuant to 314 CMR 4.06, Cape Cod Coastal Drainage Area.

Stormwater runoff from the runway, taxiways, GA paved apron, and most of the terminal apron drains via sheet flow to surrounding grass areas and infiltrates to underlying sandy soils. Salt and sand are not applied by the Airport to these paved areas.

Roof drains from the terminal building, hangar, and equipment garage all flow to the ground and either drain off the pavement and infiltrate into the ground or flow into the catch basins.

The stormwater drainage system on the terminal apron towards the ARFF/SRE garage consists of two catch basins, associated outfalls, and a trench drain, which drains into the outflow pipe for one of the catch basins. These structures collect sheet flow from small areas of the apron in front of the terminal and ARFF/SRE garage to prevent flooding and/or icing. The catch basins and trench drain have been fitted with a filtration system to intercept petroleum-based pollutants from the stormwater runoff. The filtration system contains adsorbent material that is an inert blend of minerals known as amorphous alumina silicate, which removes pollutants.

There are two automobile parking lots on the Airport property. The main parking lot, located on the north side of the terminal building, has paved traffic aisles with the parking spaces and median unpaved. The median is also equipped with a gravel swale to facilitate drainage. The smaller lot, for employee parking was constructed in a similar manner.

A Stormwater Pollution Prevention Plan (SWPPP) and a Spill Prevention Control and Countermeasures Plan (SPCCP) have been prepared for the Airport. The draft SPCCP is included in Appendix 3.

4.10 Visual Environment

The visual environment of the Airport consists of the underlying landform and the land cover (both natural and man made development). The underlying landform consists of a relatively flat floodplain surrounded by low undulating topography with long views and an open feeling. The sand dunes, grasslands and tidal flats with long views of the water and sky are defining natural landforms.

The existing visual environment of the Airport consists of a combination of natural and man made features. The visual appearance of the landscape is dependent upon the underlying landform and its land cover. The natural elements include coastal dunes, grasslands, wetlands, and the Hatches Harbor salt marsh. The vegetation cover includes grasses, shrubs, and thickets of pitch pine and scrub oak. Beyond the immediate areas surrounding the Airport facilities views of the ocean can be seen.

Since 1947, the Airport has been a component of the man made visual environment of the Outer Cape. The man made elements within the Airport include several buildings of various sizes such as the Terminal Building, the hangar, the maintenance equipment building, and Sightseeing Shack. Additional vertical elements at the Airport include the FAA instrumentation tower and light poles. The Airport area also has flat horizontal elements including the runway, the system of taxiways, and aircraft parking areas, as well as auto parking areas.

Nearby man-made elements include NPS buildings such as the Old Harbor Life Saving Station, the Province Lands Visitor Center and its 170 car parking lot, as well as the tiered, approximately 340 car parking lot for Race Point Beach. Paved roadways, including Race Point Road and Province Lands Road, and the NPS bike path are also man-made elements within the visual environment.

An assessment of the existing visual environment is provided to support the evaluation of visual impacts to the environment. The Airport and adjacent areas were divided into Visual Assessment Units. The Visual Assessment Unit is a combination of a specific landscape element and the surface area visible from a given viewpoint (viewshed). These Units provide a framework for the assessment of visual resources and potential impacts. Since a characteristic of the CCNS is the vast spatial extent, one of the Units is the distant horizon. The Units are illustrated in the accompanying photos.

The Units are discussed below in terms of landscape character, quality, and viewer groups. The dominance of form, the scale and diversity of elements, and continuity of the texture and color of the landscape form landscape character. Three elements that contribute to landscape quality include: Vividness, Intactness, and Unity. Vividness is the impression received from the visual pattern of contrasting elements. Intactness relates to the visual order of elements. Unity is the degree to which elements combine to form a harmonious visual pattern.

Viewer groups are defined in this document to include Airport user groups with a view from the airfield and terminal area as well as groups with a view of the Airport area (airfield and other currently non-secured undeveloped areas within the lease area) from various view points. Although views of the Airport are visible by users of Race Point Road, the duration of the view is limited and for that reason, users of the road are not

included as a specific viewer group. Users of the road are likely to be included in one of the following viewer groups:

- A. Visitors at the Province Lands Observation Platform
- B. Visitors at Race Point Beach Parking Area
- C. Hikers / Hunters/ Off-road users
- D. Users of the bike path
- E. Commercial airline users
- F. Passengers on sightseeing flights

Visual Assessment Units

1. Airfield

The airfield includes the runway, taxiway system, aircraft parking areas (referred to as aprons or ramps), managed grassland safety areas, the weather/navigation equipment within the infields, and sections of existing security fence. The airfield is of a uniform flat topography. Even though the area includes unpaved and paved areas, the visual character is one of uniform color, line, and texture because the specific elements are in the same horizontal plane and are similar in color except for the AWOS which is required to be a bright color. The overall airfield can only be seen from a distance by viewers in planes or at the NPS Visitor Center's observation platform. From that perspective individual elements are not very distinct. The overall airfield can be seen by Viewer Groups A, E, and F. On the ground, a small portion of the airfield at the end of Runway 25 can be seen by viewer group D. Hikers and hunters may experience views of portions of the airfield, but this is not an authorized public viewpoint and has not been included in this evaluation.



Photo 4-13 View of Airfield runway.



Photo 4-14 View of Taxiway and GA Apron.

2. Airside Terminal Area

The airside terminal area consists of the Airport buildings and terminal apron. The buildings include the airside portion of the terminal building (back) with the terminal aircraft parking apron, the hangar, the equipment building, the TSA trailer, and the Sightseeing Shack. The colors of the buildings and roofs are muted pinks, grays, and whites which blend in with the surrounding muted colors of the sand dunes, vegetation and ocean.

The airside terminal area can be seen from several viewpoints. From a distant viewpoint at the Province Lands Visitor Center observation deck, the buildings tend to flatten and have less mass. Within this viewshed, Race Point Road is a dominant visual element, along with the Beach parking area, and the horizon with the vertical elements of the former NPS Coast Guard buildings in the distance at Race Point Beach as seen in Photo 4-9.

Users of the CCNS Race Point Beach parking area also have a view of the landside terminal area which is discussed next, along with the auto parking visual assessment unit.

The airside of the Terminal Building can be seen at a distance by Viewer Groups A, E, and F. From a distance the height of the buildings is not evident and the color of the roofs and siding match the surrounding color scheme of the landscape.



Photo 4-15 Airside Terminal Apron Area. The ARFF/SRE garage is in the background with the fueling area on the left.



Photo 4-16 View from Visitor Center Observation Deck. Race Point Road is in the center and the Airport is on the left.



Photo 4-17 Airside Terminal and Apron

3. Airport Auto Parking Area and Landside Terminal Entrance

The auto parking area for the Airport is located at the front public (landside) entrance to the terminal. The lot has a paved access with a gravel base for the angled parking spaces.

The parking area can be seen from Race Point Road and the CCNS Race Point Beach parking lot, as well as by users of the bike path (Viewer Groups B and D). The parking area is also one of the visual elements in the Race Point Road intersection assessment unit discussed below. These viewer groups are within the viewshed for a short period of time and are generally on their way to other recreational areas. The parking lot cannot be seen from the observation platform and cannot be seen by users of the beach, two places where viewers tend to stay for a longer period of time.



Photo 4-18 View from NPS Beach Parking Lot. Terminal Area is in the background.



Photo 4-19 View from Bike Path. Auto parking area and Terminal entrance is in the background.



Photo 4-20 Terminal Entrance



Photo 4-21 Entrance to Airport Parking Area

4. Coastal Dunes

Coastal dunes are the predominant visual element within the Airport lease area and the Outer Cape in general. The dunes are seen from every viewpoint and at various distances. Views of the coastal dunes are provided in many photos in this section and throughout the document.



Photo 4-22 GA Parking Apron. View of northern dunes from East End taxiway.

5. Freshwater Wetlands

Although there are many isolated wetland areas within the Airport lease area, the areas are not immediately recognized as wetlands since they do not have large expanses of open water with marsh-like vegetation such as seen in the salt marsh area discussed below. The areas can be visually striking as seen in the following photo but tend to be seen visually as part of the coastal dune habitat, especially during dry periods. Additional photos of the wetlands are provided in the previous Section 4.3.



Photo 4-23 Northern Dunes. Isolated wetlands and dunes north of terminal.

6. Hatches Harbor Salt Marsh

Hatches Harbor is an approximately 200-acre salt marsh located west of Runway 7-25. Because of the topography, it is not readily seen from the ground except along the dike road, which is only accessible to hikers and off-road vehicles. The marsh can be seen in the cover photo.

7. Intersection of Race Point Road / Airport Access Drive / Beach Parking Lot Access Drive and Bike Path

Race Point Road is the main access road to the Airport and Race Point Beach. It is a two lane paved roadway that is maintained year round. Much of the roadway length is bordered by pitch pine forest. The view opens up as it enters the sandy open coastal dune habitat. At the intersection of Race Point Road, Airport Drive, the bike path, and the Beach parking lot driveway, views of the landside portions of the Airport and parking lot are visible as well as the FAA communication tower. Also within this visual unit are signs to the beach parking lot and other attractions.



Photo 4-24 Aerial View. Airport is at bottom of photo and NPS Race Point Beach Parking Lot is at the top of photo.



Photo 4-25 Race Point Road Intersection with Airport Entrance.



Photo 4-26 Airport Entrance Drive. Intersection with bike path.

8. Horizon

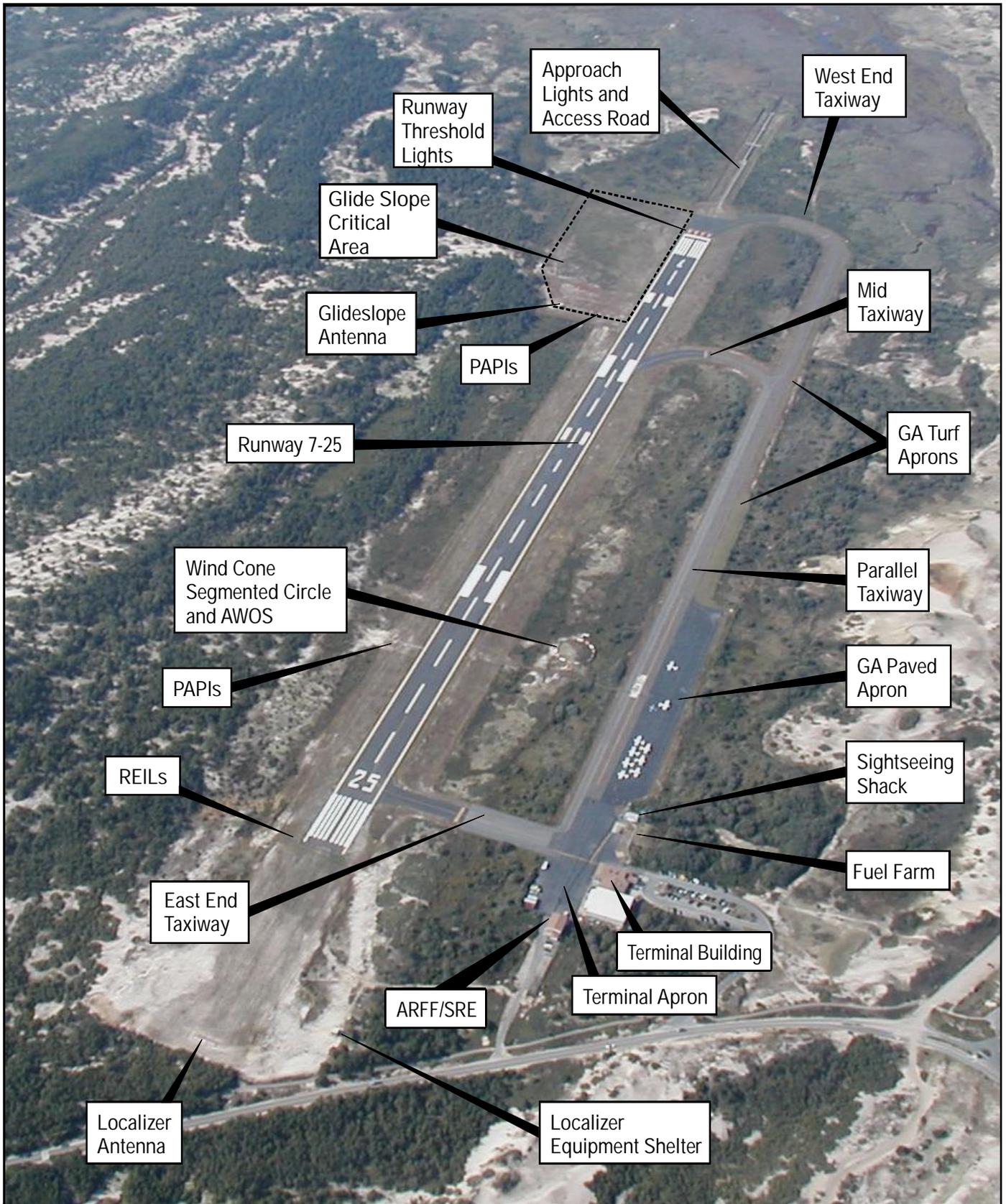
The horizon is a dominant visual feature of the Outer Cape where long views of the horizon can be seen from certain perspectives over the salt marsh and coastal dunes. The horizon cannot be seen by users of the Airport because the airfield is lower than the surrounding coastal dunes and Hatches Harbor dike. The horizon can be seen by viewers on the observation platform at the Province Lands Visitor Center (Viewer Group A, Photo 4-9). The view of the horizon includes natural features as well as the former Coast Guard buildings maintained

by the NPS. The Airport buildings are below the horizon line and contained within the back-dune area of pitch pine and scrub oak vegetation.

4.11 Section 4(f) Properties

Section 4(f) of the Department of Transportation Act of 1966, recodified at 49 U.S.C. 303 (c) but still referred to as Section 4(f), provides that the Secretary of Transportation will not approve any project that requires the use of any publicly owned land that is part of a park or recreation area unless there is no feasible and prudent alternative to the use of such land and the project includes mitigation to minimize impacts.

The land under the Airport would be considered public land as defined by Section 4(f) because it is owned by the U.S. Department of the Interior and is within the CCNS, a unit of the NPS. However, Section 3 of the 1962 authorization that conveyed the Commonwealth Province Lands to the United States for the establishment of the CCNS provides that a portion of the Province Lands are subject to a pre-existing lease for public airport and access purposes. Since the establishment of the CCNS, the Airport operates under Special Use Permits (included in Appendix 5). The NPS leases land within a prescribed boundary designated for aviation operations. This boundary is indicated as the Airport lease line on plans and figures in this document.



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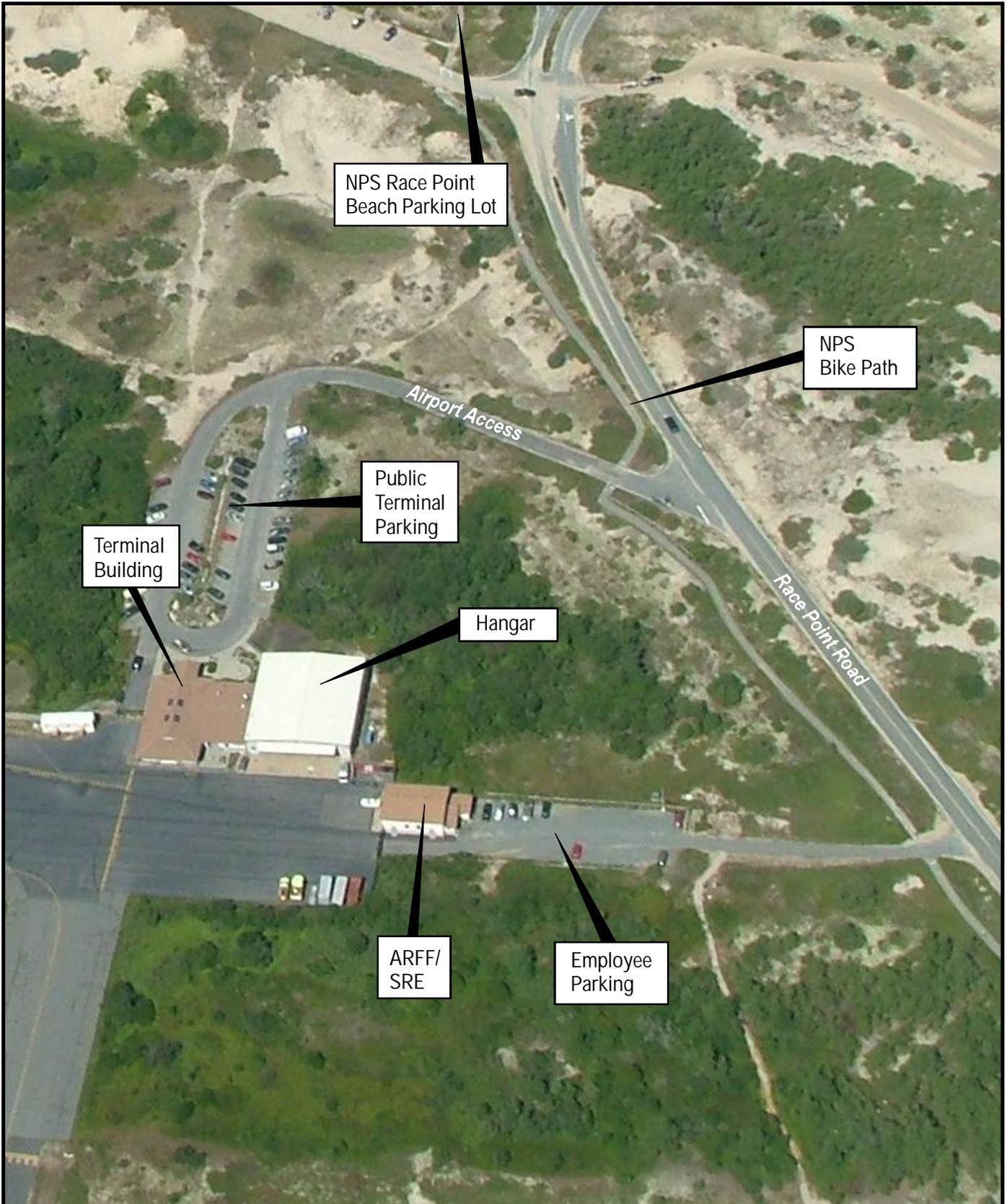


Note: See Glossary for definitions and descriptions of acronyms
 Source: Edwards and Kelcey 2004

Provincetown Municipal Airport
 Capital Improvements Plan

Airside Facilities

Figure 4.1



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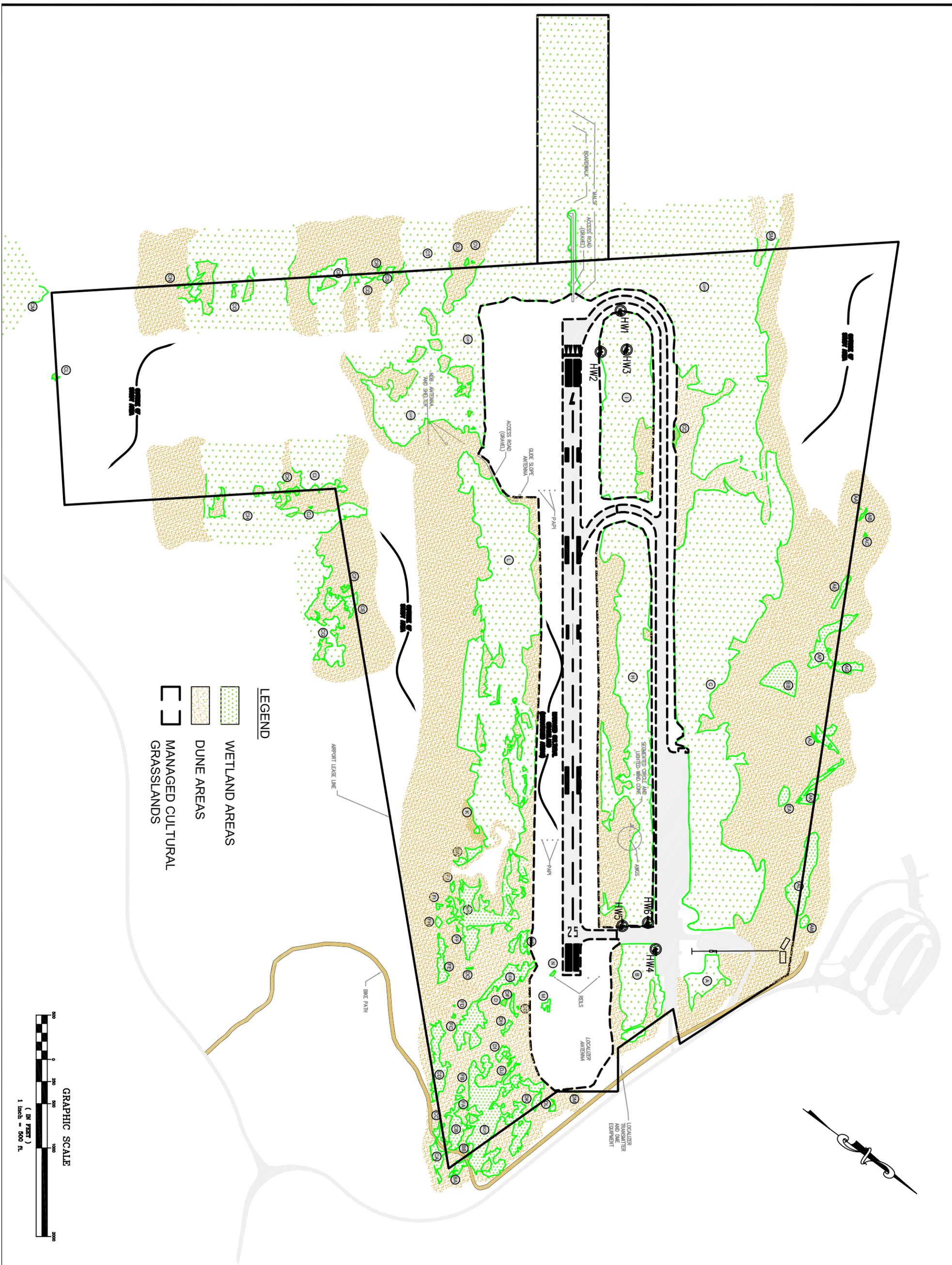
JACOBS

Source: Edwards and Kelcey 2005

Provincetown Municipal Airport
Capital Improvements Plan

Landside Facilities

Figure 4.2

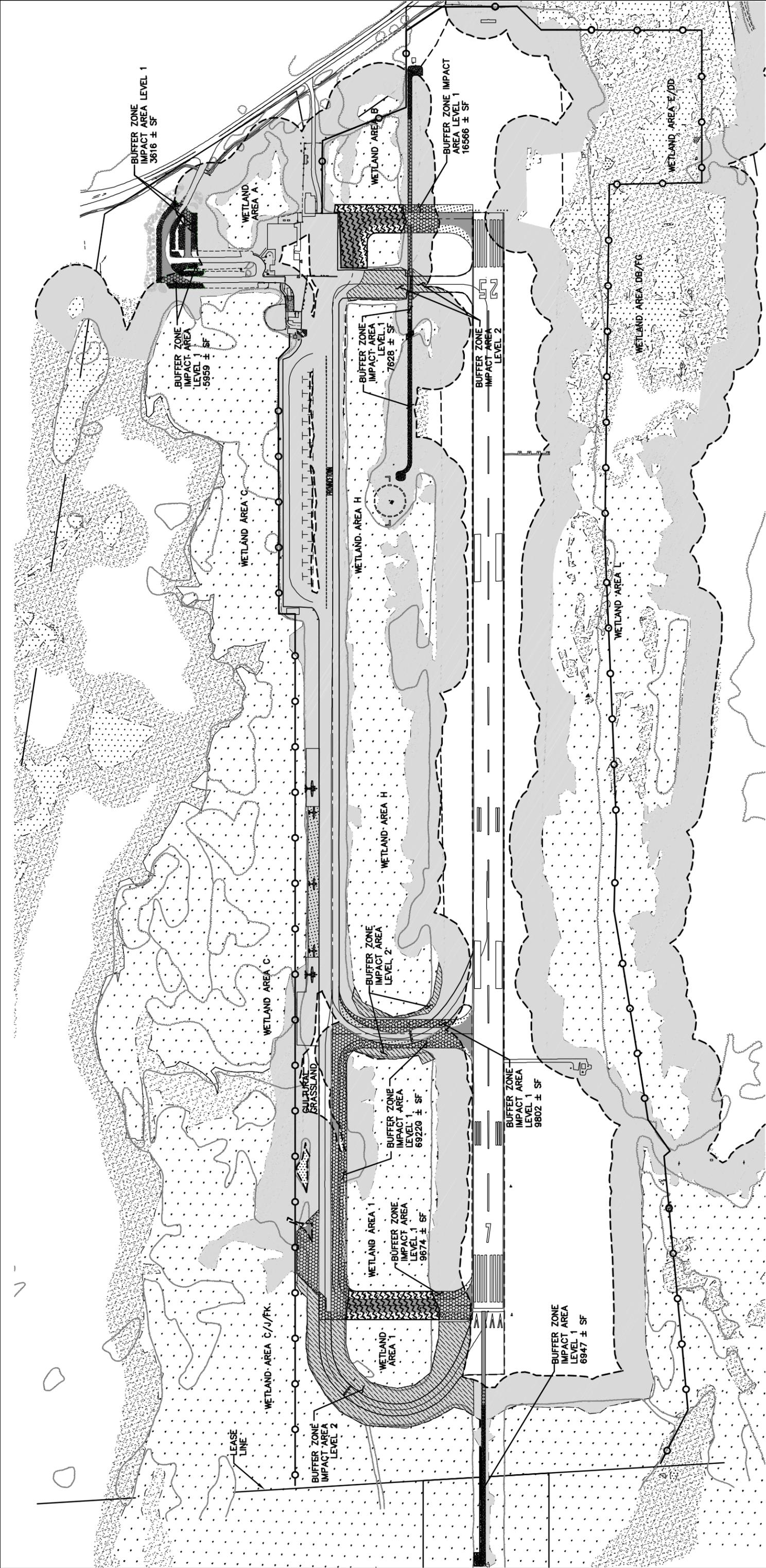


LEGEND

- WETLAND AREAS
- DUNE AREAS
- MANAGED CULTURAL GRASSLANDS



Sheet Number: 4027A	Project Number: 4027A	Survey Provided By: Horsley Witten Group, Inc. 90 Route 6A Sandwich, MA Phone: (508) 833-6600 Fax: (508) 833-3150 Dated: December 2006	Prepared For: PROVINCETOWN MUNICIPAL AIRPORT Race Point Road P.O. Box 657 Provincetown, MA 02657 508-487-0241 508-487-4110 Fax	Plan Set: PROVINCETOWN MUNICIPAL AIRPORT PROVINCETOWN, MA	Date: 11/06/07 Designed By: Drawn By: ERK Checked By: AB	Horsley Witten Group Sustainable Environmental Solutions www.horsleywitten.com 90 Route 6A Sandwich, MA 02563 508-833-6600 voice 508-833-3150 fax		Revisions																						
		Revisions Table: <table border="1"> <thead> <tr> <th>Rev.</th> <th>Date</th> <th>By</th> <th>Appr.</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>△</td> <td>9/16/08</td> <td>ERK</td> <td>AMB</td> <td>Updated Cultural Grasslands</td> </tr> <tr> <td>△</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Rev.	Date				By	Appr.	Description	△	9/16/08	ERK	AMB	Updated Cultural Grasslands	△					△					△				
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GENERAL NOTES:

1. SEE FIGURE 4.1 FOR DETAILED WETLAND AREA IDENTIFICATION.
2. BUFFER ZONE IMPACT AREA LEVEL 1 TO BE CONVERTED TO AIRPORT MANAGED AREA (PAVEMENT, GRAVEL, OR GRASSLAND).
3. BUFFER ZONE IMPACT AREA LEVEL 2 TO BE CONVERTED TO NATURAL RESOURCES.
4. FOR ALL AREAS OF LEVEL 2 RESTORATION SEE FIGURES IN SECTION 7.

Legend:

- BUFFER ZONE IMPACT AREA LEVEL 1
- BUFFER ZONE IMPACT AREA LEVEL 2
- WETLAND BUFFER ZONE
- PROPOSED IMPERVIOUS PAVED AREA
- PROPOSED WETLAND IMPACT AREA
- EXISTING WETLAND AREA
- EXISTING TREELINE
- EXISTING BRUSHLINE
- PROPOSED PERVIOUS GRAVEL AREA
- PROPOSED SECURITY FENCE

Prepared By:



Provincetown Municipal Airport
Capital Improvements Plan

Approx. Scale: 1"=300'



WETLAND BUFFER ZONE IMPACT PLAN

Figure 4.5

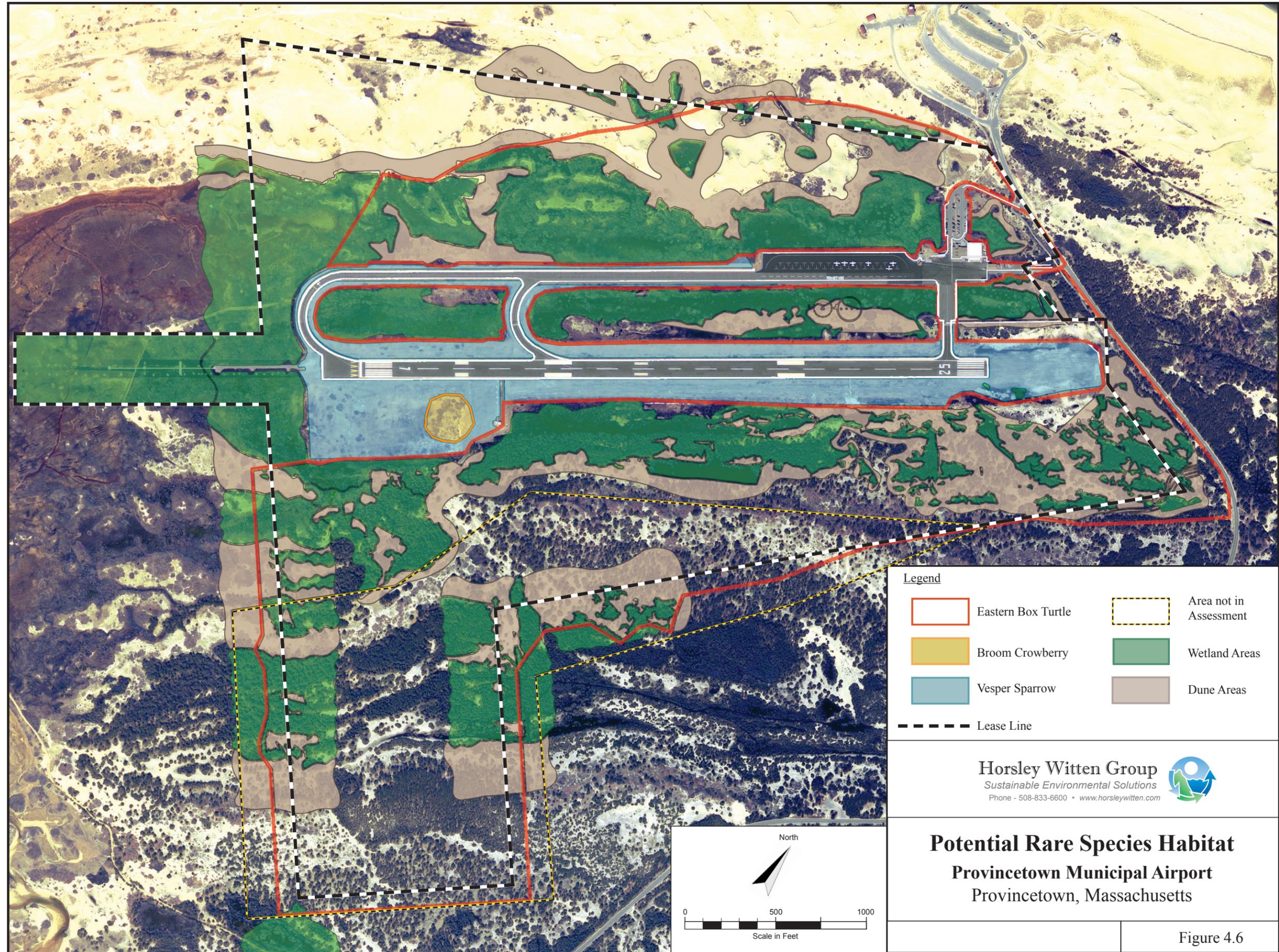


Figure 4.6

Notes and Legend:

Legend

- Eastern Spadefoot Toad (Breeding) Prime
- Eastern Spadefoot Toad (Breeding) Potential less than 1000 S.F. (less than 10m X 10m)
- Eastern Spadefoot Toad (Breeding) Potential more than 1000 S.F. (more than 10m X 10m)
- Area not in Assessment
- Wetland Areas
- Lease Line
- Proposed Fence

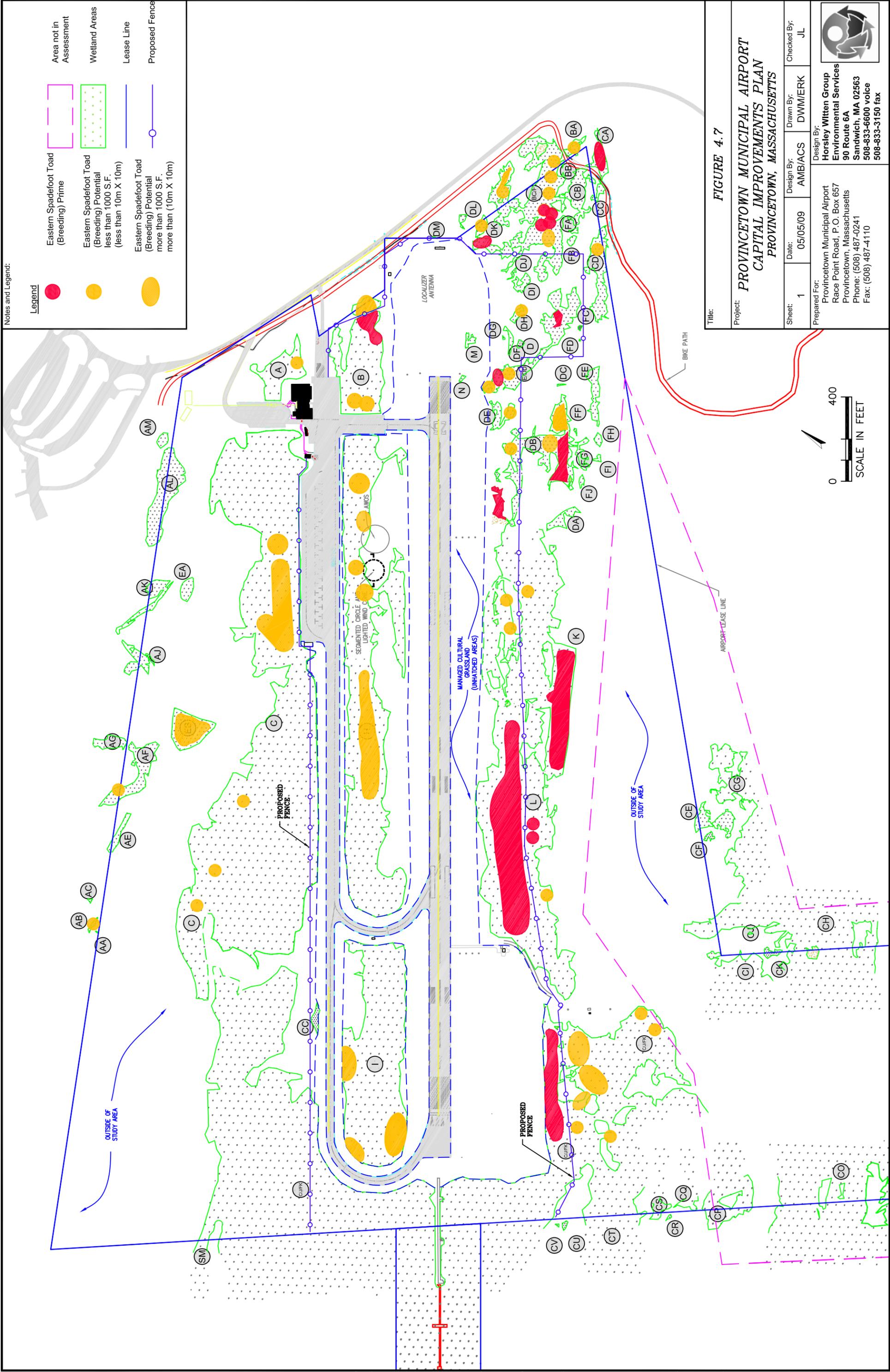


FIGURE 4.7

**PROVINCETOWN MUNICIPAL AIRPORT
CAPITAL IMPROVEMENTS PLAN
PROVINCETOWN, MASSACHUSETTS**

Sheet: 1	Date: 05/05/09	Design By: AMB/ACS	Drawn By: DWM/ERK	Checked By: JL
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